SulTRAC

October 14, 2011

Mr. Michael Berkoff
Remedial Project Manager
U.S. Environmental Protection Agency (EPA)
77 W. Jackson Blvd.
Chicago, Illinois 60604

Subject: **Technical Review Comments on Remedial Investigation Report**
Plainwell Mill Site, Operable Unit 7 of
Allied Paper/Portage Creek/Kalamazoo River Site
Plainwell, Kalamazoo County, Michigan
Remedial Action Contract (RAC) 2 No. EP-S5-06-02
Work Assignment No. 141-RSBD-059B

Dear Mr. Berkoff:

SulTRAC has reviewed the above-referenced document as part of its oversight activities for the Plainwell Mill Site located in Plainwell, Michigan. The document is dated June 2011, and was prepared by Conestoga-Rovers & Associates, Inc. for Weyerhaeuser Company, the responsible party for the site. The document contains the results of the remedial investigation that was conducted at the site.

SulTRAC reviewed the document to assess its technical adequacy and to evaluate whether it is consistent with U.S. Environmental Protection Agency (EPA) guidance for conducting remedial investigations and feasibility studies. SulTRAC's technical review comments on the document (including separate review comments on the human health and ecological risk assessments that CRA submitted as part of the report) are enclosed.

If you have any questions about this submittal, please call me at (312) 201-7491.

Sincerely,

Jeffrey Lifka
SulTRAC Project Manager

Enclosures (3)

cc: Parveen Vij, EPA Contracting Officer (letter only)
Mindy Gould, SulTRAC Program Manager
Eric Morton, SulTRAC Human Health Risk Assessor
David Homer, SulTRAC Ecological Risk Assessor
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ENCLOSURE 1

**TECHNICAL REVIEW COMMENTS ON REMEDIAL INVESTIGATION REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN**

(Six Pages)

**TECHNICAL REVIEW COMMENTS ON REMEDIAL INVESTIGATION REPORT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN**

Under Contract No. EP-S5-06-02, Work Assignment No. 141-RSBD-059B, SulTRAC, JV, (SulTRAC) was requested by the U.S. Environmental Protection Agency (EPA) to review the remedial investigation (RI) report for the Plainwell Mill Site located in Plainwell, Michigan. The RI report is dated June 2011 and was prepared by Conestoga-Rovers & Associates, Inc. (CRA) for the Weyerhaeuser Company (Weyerhaeuser), the responsible party for the site, as required by the Consent Decree. SulTRAC reviewed the document to assess whether the report is consistent with the Phase II RI work plan and current RI/feasibility study (FS) guidance.

SulTRAC's general and specific comments are presented below. The first complete paragraph on each page is identified as "Paragraph 1." An incomplete paragraph at the top of a page (one that carries over from the previous page) is identified as "Paragraph 0."

GENERAL COMMENTS

1. The RI report generally follows EPA guidance outlined in Guidance for *Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA 1988); however, the report does not include an executive summary. An executive summary should be included at the beginning of the report.

2. Given the numerous exceedances of screening criteria, site-specific soil and groundwater background sampling is necessary to evaluate the nature and extent of metals and inorganic contamination in soil and groundwater. The report alludes to possible need for collecting background samples but does not indicate when sample collection would occur. The report should be revised to discuss: (1) whether site characterization is considered complete or background sampling is needed to complete the RI phase of work, and (2) the impact of omitting site-specific background sampling.

3. Because discussions have occurred previously about proceeding with work within specific areas of the site on an accelerated schedule, the summary and conclusions section (Section 10) should discuss how the RI results may impact planned work at the Fannie Pell Bridge, coal tunnel, and public works building areas. After completion of Phase II RI field work, Weyerhaeuser and CRA proposed

additional soil and groundwater sampling related to possible construction of the Fannie Pell Bridge (soil borings SB-2014 and SB-2015). Part of the rationale for proposing only two borings was that results would be available from samples collected at other nearby locations, as shown on Figure 2 of the Fannie Pell Bridge work plan. Analytical results for the nearby sampling locations cited in the work plan (SB-270, SB-271, SB-272, SB-279, SB-280, SB-284, and MW-16) indicate that some metals/inorganics and volatile organic compounds (VOC) in soil exceed their respective Michigan Part 201 levels within these areas. In addition, polychlorinated biphenyls (PCB) exceed Part 201 criteria in a shallow soil sample from boring MW-16. Soil and groundwater analytical results from samples collected at the two borings drilled as part of the Fannie Pell Bridge work (borings SB-2014 and SB-2015) should also be presented along with RI results for Area 2B, and the results from all three areas cited should be part of discussion regarding possible acceleration of work in these areas.

4. The former Mill Building contains asbestos containing material (ACM) not discussed in the RI or in the risk assessments. The report should be revised to include a discussion of how this material relates to the overall RI/FS process, and when and how it will be addressed.

5. Section 6.0 of the RI report should include a summary of the conclusions of (1) the "Data Quality Summary Reports" generated as required by Worksheet No. 33 of the Quality Assurance Project Plan (QAPP) and (2) the "Usability Assessment" generated as required by Worksheet No. 37 of the QAPP. Particular attention should be paid to impact on the site characterization of the various analytical data qualifications (especially rejection of some analytical results) and the sample dilutions (and consequent raised detection limits).

SPECIFIC COMMENTS

1. **Pages 10, 11, 12.** The text discusses mixing RI and pre-RI data. The text should also discuss the data quality of the pre-RI data and whether reference to those data is for information purposes only or for use in decision making. The text should also refer to Figures 2.1 through 2.3 when referring to pre-RI data.

2. **Section 2.4.3, Page 21, Paragraphs 3 and 4.** The text discusses site hydrogeology. The text should be revised to state that the difference in groundwater flow patterns shown on Figures 2.12 and 2.13 may be in part due to availability of additional data points in February 2010 (the Phase II RI monitoring wells). The text should also discuss the relationship between groundwater and surface

water elevations with respect to how changes in river stage may affect groundwater elevations, flow directions, and hydraulic gradients. Therefore, the conclusions and recommendations section of the report should discuss whether periodic (monthly or quarterly) groundwater and surface water elevation measurements are necessary to gain a better understanding of groundwater flow variability.

3. **Section 2.5, Pages 21 and 22.** The text discusses numerous wells and buildings in this section. The text should be revised to refer to a figure or figures showing the features discussed.

4. **Section 3.0.** The section includes subsections that state that contaminant migration trends and groundwater modeling may be conducted. The text should state when these will be conducted within the RI/FS process. In addition, Section 3.3 should be revised to discuss activities in the past tense if any of these evaluations have been completed per discussions in Section 5 or in the risk assessments.

5. **Section 5.2.2.2, Page 46, Paragraph 1.** The text states that verbal approval was given by SulTRAC prior to sampling. Although it is just a matter of semantics, the text should be revised to state that SulTRAC "concurred" with the final sampling locations as EPA has final approval.

6. **Section 5.2.2.2, Page 47, "Sampling Program 1".** The bullet items listed under this heading should all be written in the past tense, as this work already has been completed.

7. **Section 5.2.2.2.1, Page 48, Bullet 3**. The text states that "Paper residuals were not observed in SB-101 or SB-103." The next sentence states that "Limited paper residuals were observed in SB-101 from 0.2 to 1-foot bgs (mixed with clay fill)." The text must be revised to resolve this inconsistency.

8. **Section 5.2.2.2.4, Page 53, Bullet 1.** The text states soil borings SB-324 and SB-326 could not be completed due to refusal; therefore, no samples were collected from these locations. The text should be revised to discuss whether any attempt occurred to move the borings to alternate locations in order to collect the proposed samples.

9. **Section 5.2.2.2.4, Page 52, Paragraph 3.** The text states that in Area 3A, test pits were installed to depths between 7 and 10 feet bgs. The approved Phase II RI work plan listed the completion depths of the test pits at 10 feet bgs. Similar to explaining why some borings were terminated early due to refusal, the text should explain why some test pits were terminated at depths less than 10 feet bgs.

10. **Section 5.2.2.2.5, Page 53, Paragraph 2.** The text states that in Area 3B, test pits were installed to depths between 5 and 10 feet bgs. The approved Phase II RI work plan listed the completion depths of the test pits at 10 feet bgs. Similar to explaining why some borings were terminated early due to refusal, the text should explain why some test pits were terminated at depths less than 10 feet bgs.

11. **Section 5.2.2.2.6, Page 54, Paragraph 1.** The text states that in Area 3C, test pits were installed to depths between 6 and 10 feet bgs. The approved Phase II RI work plan listed the completion depths of the test pits at 10 feet bgs. Similar to explaining why some borings were terminated early due to refusal, the text should explain why some test pits were terminated at depths less than 10 feet bgs.

12. **Section 5.3, Page 62, Paragraph 3.** The text states that pre-RI and RI data were evaluated qualitatively and quantitatively to evaluate potential sources of impacts. The text goes on to discuss application of Part 201 criteria as screening criteria, and refers to the site-specific risk assessment approach discussed in Section 8.0. As discussed in specific comment 1, the text should include a brief discussion of the usability of pre-RI data for risk assessment purposes.

13. **Section 5.4.8, Page 150, Paragraph 5.** The text states that "…. groundwater in the downgradient direction of the coal tunnel did not exhibit impacts from petroleum products and no free product was observed in the associated monitoring well." Figures 2.12 and 2.13 show groundwater flow patterns and include wells MW-2 and MW-19 in proximity to the coal tunnel area. Based on the figures, neither well is positioned in an ideal downgradient direction from the coal tunnel. The text should be revised to discuss the uncertain significance of results from these wells, given the expected groundwater flow path.

14. **Section 10.1.2, Page 248, Paragraph 1.** The text states that construction activities may also result in disturbances of contaminants in the various media. The text should be revised to also include the possibility of transport of contaminants in the subsurface to the ground surface as a result of excavation and earthwork activities.

15. **Section 10.1.3, Page 248, Paragraph 5.** The text summarizes media with contaminants posing a cumulative risk exceeding 1E-04 and hazard index of 1. The text in all relevant sections should be revised to use 1E-06 as the point of departure for evaluating carcinogenic risk. This is consistent with the proposed redevelopment plan shown on Figure 8.1 that includes future residential land use in some areas.

16. **Section 10.1.3, Page 249, Paragraph 1.** The text states that site-specific background soil samples could be collected to enable evaluation of statistically based background concentrations. Section 10.2.1 (data limitations and recommendations for future work) should be revised to include a discussion of all data gaps and of needed additional investigation activities to complete the RI and move into the FS phase of work (for example, collecting background samples, further evaluating groundwater downgradient of the coal tunnel area, and further evaluating and refining contaminants of potential ecological concern (COPEC) in ecological risk assessment Step 3).

17. **Section 10.1.3, Page 251, "Area 3".** The text summarizes the human health risk assessment for Area 3. Because the text previously discussed Area 3 by various subareas, the text should be revised to state whether this summary applies to all of Area 3 or whether human health risks differ within various sub areas (Areas 3A, 3B, 3C, 3D, and 3E). This comment also applies to the ecological risk assessment summary presented in Section 10.1.4, Page 253, Paragraph 5.

18. **Section 10.1.4, Page 253, Paragraph 4.** The last sentence in this paragraph refers to Figure 9.2. According to the figures included in the RI and the report table of contents, Figure 9.2 does not exist—apparently, the correct citation should be to Figure 8.1. If the text is referring to a figure in the ecological risk assessment presented in Appendix J, the text should be revised to clarify this. This comment also applies to the text in Paragraph 0 on Page 254.

19. **Section 10.1.4, Page 254, Paragraph 2.** The text discusses Step 3 (problem formulation) of the screening-level ecological risk assessment (SLERA). The text implies that based on the results of the SLERA, the baseline ecological risk assessment will move forward to include (1) refining COPECs, (2) considering site-specific background concentrations, and (3) using food chain models to evaluate risks to upper trophic level receptors. The text should be revised to discuss when and how these steps will occur (also see specific comment 16).

20. **Appendices A, G, and H.** The reviewers found it very difficult to correlate the following: (1) overall data summary in Appendix A, which follows sample identification order; (2) the analytical reports in Appendix G, which follow the sample collection date (except for Synthetic Precipitation Leaching Procedure [SPLP] reports, which follow no apparent order); and (3) the data validation memoranda in Appendix H, which are separate documents for each area studied. Some sort of cross-index, perhaps in the form of a spreadsheet, would be very useful and could be placed, with an explanatory note, at the start of Appendix G.

21. **Appendix G, Laboratory Report "056394 CRA SDG 05-07C K1000570 Exp".** The file for this report has been damaged and could not be opened. A usable version should be located and placed in the appendix.

22. **Appendix H, General.** It would be very useful to begin this appendix with a general summary, emphasizing the problems with the data. A fuller version of the "Data Quality Summary Reports" and the "Usability Assessment" from Worksheet Nos. 33 and 37, respectively, of the QAPP may be appropriate for that purpose.

23. **Appendix H.** Many VOC results were rejected because initial and/or continuing calibrations had a relative response factor (RRF) less than 0.05. This accords with the 1999 edition of the National Functional Guidelines (NFG), cited in Worksheet No. 36 of the QAPP. However, more recent editions of the NFG (dating from 2005 and 2007, as well as the current edition of 2008), include "Table 15. Volatile Compounds Exhibiting Poor Response" and specify that those compounds will not be qualified unless their RRFs are less than 0.01. All of the frequently rejected compounds—acetone, 2-butanone, 4-methyl-2-pentanone, 2-hexanone, and 1,2-dibromo-3-chloropropane—are listed in that Table 15, and have RRFs equal to or exceeding 0.01 in all cases discussed in the data validation memoranda within this appendix. Consideration should be given to modifying the data validation memoranda and data tables to reflect the current guidance from EPA.

24. **Appendix H.** Many of the acidic semivolatile organic compound (SVOC) results were rejected due to very low recoveries (less than 10 percent) of one or more of the four acidic surrogates used by the laboratory in the analysis. The narratives in the laboratory reports note that many samples subjected to SPLP extraction increased the pH of the extraction fluid from 4.2 to about 10 during the extraction. The alkalinity of the soil would cause severe matrix interference with extraction of the acidic SVOC, as reflected in the surrogate recoveries. This matrix interference should be discussed, along with its implications for data completeness and usability.

25. **Appendix H.** Many PCB analytical results were analyzed at a dilution, had irregular surrogate recoveries, or both. The laboratory reports noted that these phenomena were apparently due to matrix interference, especially in some samples with an "oily" appearance or a third phase in the extraction process. This interference should be discussed, along with its implications for data completeness and usability.

ENCLOSURE 2

**TECHNICAL REVIEW COMMENTS ON THE
BASELINE HUMAN HEALTH RISK ASSESSMENT
PLAINWELL MILL SITE, OPERABLE UNIT 7 OF
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
PLAINWELL, KALAMAZOO COUNTY, MICHIGAN**

(12 Pages)

TECHNICAL REVIEW COMMENTS ON THE BASELINE HUMAN HEALTH RISK ASSESSMENT PLAINWELL MILL SITE, OPERABLE UNIT 7 OF ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

Under Contract No. EP-S5-06-02, Work Assignment No. 141-RSBD-059B, SulTRAC, JV, (SulTRAC) was requested by the U.S. Environmental Protection Agency (EPA) to review the Human Health Risk Assessment (HHRA) for the Plainwell Mill Site located in Plainwell, Michigan. The HHRA was prepared by Conestoga-Rovers & Associates, Inc. (CRA) for the Weyerhaeuser Company as required by the Consent Decree, and is included in CRA's Remedial Investigation Report dated June 2011. SulTRAC reviewed the document to assess whether the HHRA report is consistent with the HHRA work plan and current risk assessment guidance.

The errors and concerns identified by SulTRAC appear in the general and specific comments below. The first complete paragraph on each page is identified as "Paragraph 1." An incomplete paragraph at the top of a page (one that carries over from the previous page) is identified as "Paragraph 0." References cited in the comments are listed following the specific comments.

GENERAL COMMENTS

1. The HHRA generally follows the approved work plan and relevant EPA and state risk assessment guidance. Several issues must be addressed before the HHRA can be approved, and these are described in the specific comments.

2. Section 8.1.2.3 (page 159) states "The analytical results for samples collected from soil and groundwater are summarized and discussed in Sections 2.0 and 5.0." It is not clear from this single statement whether both pre-remedial investigation (RI) and RI data were considered quantitatively in the HHRA. The HHRA should be revised to clearly state which analytical data were used as part of the quantitative risk assessment calculations. Also, the HHRA does not specifically state that the data considered quantitatively in the risk assessment were evaluated in accordance with EPA's "Guidance for Data Usability in Risk Assessment (Part A) Final" (EPA 1992). This is especially important if pre-RI and RI data were combined for the purposes of quantitative HHRA calculations. Therefore, the HHRA should be revised to state and document that all of the analytical data used to prepare quantitative risk assessment calculations were evaluated in accordance with the above-referenced

EPA guidance, and that it was appropriate to combine the pre-RI and RI data for use in the quantitative risk assessment.

3. The HHRA is based on the conceptual mill redevelopment plan (Figure 8.1). If this plan changes and the Site is redeveloped in a different fashion, the results of the HHRA may no longer be valid and may have to be redetermined.

4. Maximum concentrations were used as the exposure point concentrations (EPC) for surface soil and soil under both reasonable maximum exposure (RME) and central tendency exposure (CTE) conditions. This is a very conservative approach and does not follow EPA guidance (EPA 2010). The HHRA should be revised to (1) explain, justify, and document the use of maximum concentrations as EPCs or (2) calculate EPCs as per EPA guidance (e.g., 95 UCL) (EPA 2010). The same EPC should be used for both RME and CTE conditions.

5. Current land use scenarios were evaluated assuming exposure to surface soil. Future land use scenarios were evaluated assuming exposure to soil (defined for the HHRA as combined surface and subsurface soil). However, potential future exposures could also be to surface soil only. For example, buildings may be constructed using slab-on-grade construction. Also, construction of the recreational path planned for along the river may not require extensive intrusive activity. Potential recreational users would be better evaluated assuming exposure to surface soil. Therefore, the HHRA should be revised to add evaluation of future land use scenarios involving nonintrusive activity (residents, recreational users, and commercial-industrial workers), assuming exposure to surface soil only. The existing evaluation of future land use scenarios involving these receptors, assuming exposure to soil, should be retained.

6. The HHRA does not consider multiple receptor-specific exposures by a single individual. For example, a Site resident may also be a recreational user. Similarly, a Site worker may live at the Site or may also be a recreational user. The HHRA should be revised to identify, discuss, and present calculations for potential cumulative exposures, hazards, and risks for a series of reasonable exposure scenario combinations (including, but not necessarily limited to those discussed above).

7. The HHRA apparently assumes that all chromium is present as trivalent chromium. The HHRA should be revised to justify and document this assumption, including discussion of any species-specific sampling results from the Site. If the assumption that all chromium at the Site is present as trivalent chromium cannot be adequately justified (ideally by consideration of site-specific speciation

data), revision of the HHRA will be necessary under the assumption that all or part of the chromium at the Site is present as hexavalent chromium.

8. The HHRA presents summary statistics for both total and dissolved groundwater results. The HHRA should be revised to clarify that all potential exposures were evaluated using total groundwater concentrations. The HHRA should also be revised to clarify if and how dissolved groundwater data were used in the HHRA.

9. The HHRA does not consistently provide citations and full references for sources referred to in the text. For example, on page 161, "MDEQ's RRD Operational Memorandum No. 2 Frequently Asked Questions, February 2005" is mentioned without a reference citation. All sources/references mentioned in the text should be accompanied by a reference citation so the reader can readily identify and locate the correct source/reference.

10. Several acronyms and abbreviations (A&A)— including %, OSWER, and PPRTV—were not defined at first appearance in the text. The HHRA should be revised to define all A&A at first use. The A&A list should include all A&A defined in the text.

SPECIFIC COMMENTS

1. **Section 8.1.2.1, Page 156, Paragraph 3.** Section 8.1.2.1 discusses the human health conceptual site model (CSM) for the Site. This paragraph states that Area 2 "has been proposed for possible re-development for recreational and/or commercial purposes." This statement is consistent with the in-text table on page 157 that summarizes the human receptors considered in each area of the site. However, the human health CSM (Figure 8.1) shows that Area 2 is proposed for possible re-development to host the Plainwell city hall, as well as for mixed use, which is defined as residential, commercial, office space, and special events. The various uses considered or Area 2 must be presented consistently throughout the HHRA. If Area 2 is not being considered for possible residential use, Figure 8.1 must be revised accordingly. However, if Area 2 is being considered for possible residential use, the HHRA must be revised to provide the appropriate residential results for Area 2.

2. **Section 8.1.2.1, Page 157, Paragraph 1.** The in-text table at the top of page 157 shows all construction/utility work as occurring in the future. This seems particularly unlikely, especially in Area 2, currently used for light commercial and governmental activities. Current activity in Area 2 suggests that various utilities are active and may require servicing. Therefore, construction/utility activities for Area 2 should be described as current, as well as future. Section 8.1.2.1 should also be revised to clearly state whether any utilities are currently active in Areas 1 and 3 at the Site. If so, construction/utility activities should be described as current, as well as future, for these areas as well.

3. **Section 8.1.2.2, Page 158, Paragraph 1.** Section 8.1.2.2 discusses the characteristics of the various human receptors considered in the HHRA. The commercial worker is described in terms of future conditions. However, at least a limited amount of commercial work is currently occurring in Area 2. Section 8.1.2.2 and the remainder of the HHRA should be revised to accurately report and incorporate all current and potential future land uses at the site.

4. **Section 8.1.2.3, Page 159, Paragraph 1.** Section 8.1.2.3 presents the selection of chemicals of potential concern (COPC). The text discusses the Michigan Department of Environmental Quality (MDEQ) Part 201 Cleanup Criteria, Part 213 Risk-Based Screening Levels, and the MDEQ Operational Memoranda for the Remediation and Redevelopment Division. However, no citations are provided for these sources. Without references, the reader may not be able to readily locate the sources with assurance that the reader will have found the same sources referred to in the text. Section 8.1.2.3 should be revised to provide citations for all sources and references referred to in the text.

5. **Section 8.1.2.3, Page 159, Paragraph 2.** The text identifies a cancer risk of one-in-one hundred thousand (1E-05) and a noncarcinogenic hazard index (HI) of 1 as the fixed risk levels upon which the cleanup criteria and/or risk-based screening levels used to identify COPCs are based. These risk levels are not health-protective and are not consistent with standard EPA practice. EPA's acceptable risk range is 1E-06 to 1E-04 (EPA 1990). Therefore, a cancer risk of 1E-06 should be used as the risk-based cancer level for evaluating potentially carcinogenic constituents. On the noncarcinogenic side, multiple constituents can impact the same target organ or system. Therefore, even if all constituents are less than their respective screening levels based on a HI of 1, the cumulative noncarcinogenic HI may be greater than 1, indicating a potential hazard. Therefore, a HI of 0.1 should be used as the risk-based noncarcinogenic level for evaluating noncarcinogenic constituents. Section 8.1.2.3 and related tables and discussions should be revised accordingly.

6. **Section 8.1.2.3, Page 160, Paragraph 1.** Subsurface soil is described as "all soils from greater than 1 foot bgs [below ground surface] to the maximum depth evaluated (18 feet bgs)." Exposure of human receptors to soil below a depth of 10 or 12 feet bgs is not expected. The HHRA should be revised to define subsurface soil as soil at depths exceeding the interval of 1 foot bgs to 10 or 12 feet bgs (depth chosen should be based on the depth intervals employed in the remedial investigation [RI]). A less preferred alternative would be to revise Section 8.1.2.3 to provide a compelling justification for including soil deeper than the typical range of human exposure as part of subsurface soil.

7. **Section 8.1.3.1.1, Page 163, Paragraph 2.** Section 8.1.3.1.1 describes current land use at the Site. The text states that the Site is currently vacant except for some areas used by the City of Plainwell "for storage of various seasonal decorative supplies and presentation rooms, fire hose testing, and ambulance driver testing." However, during a site visit, it appeared that a portion of the main building at Area 2 was being used (at least on an occasional basis) as office space by various individuals, including consultants to the City of Plainwell. Section 8.1.3.1.1 should be revised to discuss any use of the main building at Area 2 as office space.

8. **Section 8.1.3.1.1, Page 164, Paragraph 0.** The text states that potential human receptors under current land use conditions are limited to "persons who may infrequently trespass on the Site." However, as noted in Specific Comments 2 and 7, it appears that at least some utilities at Area 2 are active, and portions of the main building at Area 2 are at least infrequently used for various commercial and governmental businesses. Therefore, utility workers and commercial/industrial workers should be added to the list of current receptors at Area 2 of the Site.

9. **Section 8.1.3.2, Page 164, Paragraph 4.** Section 8.1.3.2 discusses the potential exposure pathways evaluated in the HHRA. The discussion would be improved by citing the human health CSM in the text. Section 8.1.3.2 should be revised to include a citation to and discussion of the CSM. (Note: a citation to the CSM could come as early as Section 8.1.3.)

10. **Section 8.1.3.2.1, Page 165, Paragraph 1.** Section 8.1.3.2.1 presents and discusses the release mechanisms through which site contaminants may be released into and move throughout the environment. The second bullet presents the "Potential release of contaminants from contaminated surficial soil through contact with surface water." This item should be expanded and clarified to note that contaminants from contaminated surficial soil may be impacted by precipitation and subsequent erosion and runoff, not just "through contact with surface water."

    Contaminants at the Site present in groundwater or that may subsequently reach groundwater may migrate toward and discharge into adjacent surface water. Therefore, the list of release mechanisms should be expanded to include groundwater-surface water interaction.

11. **Section 8.1.3.2.1, Page 165, Paragraph 4.** The first line of this paragraph states, "The majority of the Site is covered with asphalt and concrete pavement. . .." It should be noted that the asphalt and concrete pavement at the Site has not been well maintained. Numerous cracks are present across the Site. Section 8.1.3.2.1 should be revised to identify and explain the relative disrepair and the presence of numerous cracks in the asphalt and concrete pavement at the Site.

12. **Section 8.1.3.2.1, Page 166, Paragraph 2.** The discussion identifies the potential for volatile soil contaminants to migrate to ambient and/or indoor air. Non-volatile soil contaminants can also be introduced into the ambient air as part of fugitive dust emissions. Section 8.1.3.2.1 should be revised to discuss fugitive dust emissions.

13. **Section 8.1.3.2.2, Page 166, Paragraph 3.** Section 8.1.3.2.2 discusses fate and transport in receiving media. The list of potential contaminant transport mechanisms at the Site does not include uptake of contaminants into homegrown produce. It is not unreasonable to assume that residential and recreational redevelopment (e.g., parks) may include individual or community gardens, which may include homegrown produce. Therefore, Section 8.1.3.2.2 and the HHRA as a whole should be revised to include consideration and evaluation of potential human exposure through ingestion of homegrown produce.

14. **Section 8.1.3.2.5, Pages 168 and 169, Paragraphs 5 and 0.** Section 8.1.3.2.5 discusses the exposure scenarios and completed exposure pathways considered for the site. The text states, "Access to the Site is restricted by a perimeter fence thus it is unlikely that trespassers would actively frequent the Site." The perimeter fence is not topped by barbed wire and is not especially tall; therefore, it is a minimal barrier to accessing the Site. Also, signs of trespassing such as footprints have been

observed at the Site. Finally, at least historically, squatters have been observed at some of the Site buildings. Section 8.1.3.2.5 should be revised to provide a more even-handed and complete discussion of the potential for and evidence of trespassing at the Site.

15. **Section 8.1.3.1.2, Page 164, Paragraphs 1 and 2.** Section 8.1.3.1.2 describes potential future land uses at the Site. In paragraph 1, the text does not identify potential future land use at Area 2 of the Site. However, Figure 8.1 identifies Area 2 for potential residential use. Section 8.1.3.1.2 and the remainder of the HHRA should be revised to consistently describe and evaluate the potential for future residential use of Area 2. Also, in paragraph 2, the text describes future potential construction/utility worker exposures as "short-term." While construction activities may reasonably be assumed short-term (roughly 6 months to a year or less), utility work, particularly at a large and complicated redevelopment project as envisioned for the Site, may require long-term inspection and repair activities. Therefore, Section 8.1.3.1.2 and the remainder of the HHRA should be revised to describe and evaluate potential future (and current, see Specific Comments 2 and 7) utility work as possibly long-term (greater than 6 months to a year and possibly much longer).

16. **Section 8.1.3.3, Page 170, Paragraph 1.** Section 8.1.3.3 lists the primary references used to prepare the HHRA. The list does not contain any references to Michigan-specific HHRA guidance, such as MDEQ's Part 201 Cleanup Criteria, Part 213 Risk-Based Screening Levels, and related Operational Memoranda. Section 8.1.3.3 should be revised to include primary state HHRA guidance documents and tools used in the HHRA.

17. **Section 8.1.3.3.2, Pages 177 and 178, Paragraphs 5 and 0.** Section 8.1.3.3.2 presents the exposure scenario-specific assumptions used in the HHRA. The skin surface area used for the adolescent trespasser is reported as 3,900 square centimeters (cm^2). Footnote 4 of the in-text table indicates that this is based on 25 percent of the 50 percentile total body surface area for an adolescent. No reference is presented for the use of a value of 25 percent to account for exposed skin. It should be noted that, based on EPA's *RAGS Part E* (EPA 2004), and assuming potential exposed skin consisting of the face, hands, forearms, lower legs and feet, a skin surface area of about 4,473 cm^2 was calculated. Section 8.1.3.3.2 should be revised to provide justification for the assumptions used to calculate a skin surface area of 3,900 cm^2, or revise the HHRA to use a skin surface area of 4,473 cm^2 for the adolescent trespasser.

18. **Section 8.1.3.3.2, Pages 180 and 181, Paragraphs 3 and 0.** The in-text table for the resident receptor uses footnotes 1 through 9 in the table, but lists footnotes 8 through 16 in the list of footnotes. The in-text table should be revised to list footnotes 1 through 8 in the list of footnotes.

19. **Section 8.1.3.4.1.2, Page 189, Item (i).** Section 8.1.3.4.1.2 presents the exposure input parameter values used for the adult lead model. Item (i) indicates that the maximum lead concentrations in various media were used. In contrast, EPA guidance states that average lead concentrations should be used as input parameter values (EPA 2003, 2009a, 2009b). Section 8.1.3.4.1.2 and related adult lead model calculations should be revised accordingly.

20. **Section 8.1.4, Page 192, Paragraph 2.** Section 8.1.4 presents the toxicity assessment of the HHRA. The indicated paragraph lists the primary sources of toxicity values used in the HHRA. The text should be revised to present reference citations for each of the sources used in the HHRA.

21. **Section 8.1.5, Page 195, Paragraph 6.** Section 8.1.5 presents the risk characterization portion of the HHRA. The last sentence of this paragraph lists the EPA guidance documents used to prepare the HHRA. The parenthetical list includes U.S. EPA 2001. Section 11 lists the references used in the HHRA. Section 11 includes EPA 2001a and 2001b. It appears that EPA 2001b is the correct human health reference cited on Page 195. Section 8.1.5 should be revised to list EPA 2001b.

22. **Section 8.1.5.3, Page 198, Paragraph 1.** Section 8.1.5.3 presents a summary of the receptor-specific risks quantified for each receptor. The in-text table reports the non-carcinogenic hazard under central tendency (CT) conditions for the future recreational user as 7.0E-00. This result is incorrect; the correct value is 7.0E-01. The in-text table should be revised accordingly.

23. **Section 8.1.5.4, Pages 200 through 203.** Section 8.1.5.4 presents a summary of receptor-specific risks. Summations are presented for a combination of exposure pathways that each receptor is reasonably expected to encounter. However, a specific individual may be a member of more than one receptor group. For example, a future resident may also be a recreational user. Similarly, current or future commercial/industrial workers may also be recreational users. The total risks faced by these receptors would be a summation of the receptor-specific risks. Acknowledging and accounting for possible double-counting is necessary. Revising Section 8.1.5.4 is important to identify and discuss (including quantitative summaries) the possibility of membership of individual receptors in more than one receptor group, and to present risk summaries for these multi-receptor individuals.

24. **Section 8.1.5.6, Page 205, Paragraph 1.** Section 8.1.5.6 discusses COPC-specific risk and hazard contributions. The text indicates that the area- and receptor-specific summary tables present COPC-specific results that contribute approximately 95 percent of the overall cumulative risk for that receptor. The summary tables include at a minimum chemicals with risks ≥ 1E-04. This approach is insufficient. It is not unreasonable to present 95 percent of the cumulative risk for each receptor. However, the summary tables should identify all COPCs associated with risks ≥1E-06 and hazards ≥ 1. If a list of contributing chemicals of concern (COC) becomes too long, footnotes can be used to document those COCs contributing to the various overall cumulative risks and hazards.

25. **Section 8.1.5.6, Page 205, Paragraph 3.** The text discusses the possibility of collecting soil samples representative of local background soil concentrations. The text refers to "MDEQ Statewide Background Levels"; however, no reference citation is provided. Section 8.1.5.6 should be revised to include a reference citation for the "MDEQ Statewide Background Levels" referred to. The text should also specify which particular statewide background levels are referred to and were used in the HHRA; that is, the text should specify—by reference to a particular section, page, or table number—the area of the State and soil type selected for the statewide background values used in the HHRA.

26. **Section 10.1.3, Pages 248 through 252.** Section 10.1.3 presents a summary of the HHRA. This section should be revised to incorporate any changes to the HHRA required by the general and specific comments.

27. **Appendix I.1.** Appendix I.1 presents the Area 1 human health risk assessment tables. Area 1 calculations were closely checked. The comments presented below may not all apply to Appendixes I.2 and I.3. However, the comments should be considered reasonable approximations surrogates for the types of comments that would result from close checks of Area 2 and Area 3 human health risk assessment tables. Therefore, Appendixes I.2 and I.3 should be closely reviewed and revised accordingly.

    a. Table I.1.1 presents the selection of COPCs for surface soil at Area 1. The column titled "Screening Toxicity Value" presents the lowest of soil protective ambient air and direct contact screening criteria. Footnote 4 states that if the statewide default background level exceeds the selected criterion, the background level is selected as the screening criterion. The reader cannot readily identify the basis for each selected chemical-specific criterion. Table I.1.1 (and other similar tables) should be revised to provide the basis for each chemical-specific screening toxicity value.

b. Table I.1.7 presents the exposure parameter values used for surface soil exposure to the adolescent trespasser. Footnote 5 presents chemical-specific absorption factors (ABS). The footnote presents values for volatile organic compounds (VOC) with vapor pressures less than and greater than benzene. However, footnote 5 does not provide an ABS value for benzene itself. Table I.1.7 (and other similar tables) should be revised to present an ABS value for benzene.

c. Tables I.1.21 and I.1.22 present the exposure parameter values for groundwater household use for future residents, and calculation of the dermal groundwater parameter DA_{event}, respectively. The DA_{event} values in Table I.1.22 were calculated using the same equations as in Table I.1.21, except that two parameters— concentration of water (C_w) and a conversion factor (CF)—were absent from the equations presented in Table I.1.21. Tables I.1.21 and I.1.22 (and other similar tables) should be revised in a coordinated manner to ensure that the reader is aware that the DA_{event} values listed in Table I.1.22 must be multiplied by chemical-specific C_w values and a CF for use in the equations presented in Table I.1.21.

   In Table I.1.21 (page 2 of 2), the reasonable maximum exposure (RME) and CT values for the parameter fraction time exposed – child (FT-child) are switched. Table I.1.21 should be revised accordingly.

   In Table I.1.22, the last column header includes a "1" superscript. However, the table does not include any footnotes. Table I.1.22 (and other similar tables) should be revised by adding a footnote 1 corresponding to this apparent footnote or removing the apparent footnote.

d. Table I.1.33.RME presents the cancer risks and noncarcinogenic hazards for the future commercial worker in Area 1 under RME conditions. The exposure medium is listed as surface soil. However, as described in the text, future conditions were evaluated only for a combination of surface soil and subsurface soil. Therefore, Table I.1.33.RME (and other similar tables for future scenarios) should be revised to present the exposure medium as surface and subsurface soil. (Note: as stated in General Comment 4, the HHRA should be revised to evaluate future exposures of all receptors other than utility and construction workers to surface soil only, as well as to the combination of surface and subsurface soil.)

e. Table I.1.35.CT presents a summary of current trespasser risks and hazards under CT conditions. The documentation of results presented in this Table I.1.35.CT would be improved by including in this table references to tables presenting the exposure pathway-specific results summarized in this Table I.1.35.CT. Therefore, Table I.1.35.CT (and other related tables) should be revised accordingly.

f. Table I.1.36.CT presents a summary of future trespasser risks and hazards under RME conditions. The non-carcinogenic hazard quotient for mercury through inhalation is presented as 2.64E-08; the correct value is 2.88E-05. Table I.1.36.CT should be revised accordingly. Similarly, the total noncarcinogenic hazard index through inhalation is presented as 1.73E-04; the correct value is 2.01E-04. Table I.1.36.CT should be revised accordingly.

g. Table I.1.40.CT presents a summary of future construction/utility worker risks and hazards under CT conditions. The total non-carcinogenic hazard index through inhalation and dermal contact are reported as "NC" and 3.04E-02, respectively; the correct values are 2.03E-01 and 2.23E-02, respectively. Table I.1.40.CT should be revised accordingly.

h. Table I.1.40.RME presents a summary of future construction/utility worker risks and hazards under RME conditions. The total carcinogenic risks through ingestion, inhalation, and dermal contact are presented as 2.48E-07, 3.14E-10, and 1.04E-07, respectively; the correct values are 3.06E-06, 4.38E-08, and 2.75E-07, respectively. Table I.1.40.RME should be revised accordingly. Similarly, the non-carcinogenic hazard indexes through ingestion, inhalation, and dermal contact are presented as 4.34E-01, "NC", and 1.82E-01, respectively; the correct values are 8.12E-01, 4.06E-01, and 1.34E-01, respectively. Table I.1.40.RME should be revised accordingly.

28. **Appendix I.4.** Appendix I.4 presents the indoor air modeling for the HHRA. The appendix states that site-specific soil gas attenuation factors for the soil to the indoor air pathway were calculated through application of EPA's Johnson & Ettinger Excel spreadsheet model "SL-ADV-Feb04.xls". Appendix I.4 should be revised to include the model spreadsheets documenting the calculated attenuation factors.

REFERENCES

U.S. Environmental Protection Agency (EPA). 1990. "National Oil and Hazardous Substances Pollution Contingency Plan." *Federal Register*. Volume 55, Number 46. April 9.

EPA. 1992. "Guidance for Data Usability in Risk Assessment (Part A) Final." Office of Emergency and Remedial Response. Publication 9285.7-09A. April.

EPA. 2003. Recommendations of the Technical Review Workgroup for Lead for an Interim Approach for Assessing Risks Associated with Adult Exposures to Lead in Soil. Technical Review Workgroup for Lead. January. Final (December 1996). EPA-540-R-03-001. January. On-Line Address: http://www.epa.gov/superfund/lead/products/adultpb.pdf

EPA. 2004. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment*). Final. Office of Superfund Remediation and Technology Innovation. EPA/540/R/99/005. July.

EPA. 2009a. Technical Memorandum Regarding Update of the Adult Lead Methodology Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters. From James E. Woolford, Director, Office of Superfund Remediation and Technology Innovation. To Superfund National policy Managers and Regional Risk Leads. OSWER 9200.2-82. June 26. On-Line Address: http://www.epa.gov/superfund/lead/products/almupdate.pdf

EPA. 2009b. Frequent Questions from Risk Assessors on the Adult Lead Methodology (ALM). October 27. On-Line Address: http://www.epa.gov/superfund/lead/almfaq.htm

EPA. 2010. "ProUCL Version 4.1.00 Technical Guide (Draft)." EPA/600/R-07/041. Prepared by A. Singh, N. Armbya, A.K. Singh. Office of Research and Development, Washington, DC. May.

ENCLOSURE 3

TECHNICAL REVIEW COMMENTS ON THE SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PLAINWELL MILL SITE, OPERABLE UNIT 7 OF ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

(Eight Pages)

TECHNICAL REVIEW COMMENTS ON THE SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PLAINWELL MILL SITE, OPERABLE UNIT 7 OF ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE PLAINWELL, KALAMAZOO COUNTY, MICHIGAN

Under Contract No. EP-S5-06-02, Work Assignment No. 141-RSBD-059B, SulTRAC, JV, (SulTRAC) was requested by the U.S. Environmental Protection Agency (EPA) to review the Screening-Level Ecological Risk Assessment (SLERA) for the Plainwell Mill Site located in Plainwell, Michigan. The SLERA was prepared by Conestoga-Rovers & Associates, Inc. (CRA) for the Weyerhaeuser Company as required by the Consent Decree, and is included in CRA's Remedial Investigation Report dated June 2011. SulTRAC reviewed the document to assess whether the SLERA report is consistent with the ecological risk assessment (ERA) work plan and current ecological risk assessment guidance.

The errors and concerns identified by SulTRAC appear in the general and specific comments below. The first complete paragraph on each page is identified as "Paragraph 1." An incomplete paragraph at the top of a page (one that carries over from the previous page) is identified as "Paragraph 0."

GENERAL COMMENTS

1. The SLERA generally follows the approved work plan and relevant EPA ecological risk assessment guidance. Several issues must be addressed before the risk assessment can be approved, and these are described in the specific comments.

2. The SLERA section provides screening quotients (SQ) for a number of receptors and exposure pathways; however, SQs are not provided consistently throughout this section. It would benefit the reader to provide a summary table that highlights by area the significant risks (SQ greater than 1) by receptor and chemicals of potential ecological concern (COPEC). This would help focus the risk management discussion.

SPECIFIC COMMENTS

1. **Section 9.1.5, Page 220, Paragraph 3**. The text states that the only medium considered in the SLERA is soil. However, the work plan states the following: "Although ecological receptors are not generally directly exposed to undiluted groundwater, aquatic organisms will be exposed to groundwater once it discharges to nearby surface waters. Thus, complete exposure pathways currently exist from groundwater to various aquatic biota. Moreover, if the chemicals bioaccumulate readily, semi-aquatic predators of the aquatic biota could be secondarily exposed via the food chain. These exposure pathways will be considered in the ERA." Either explain why the groundwater pathway was not evaluated, or evaluate the groundwater exposure pathways.

2. **Section 9.1.5, Page 220, Paragraph 3, Bullet 1, and Figure 9.1**. The surface soil exposure routes for direct contact and absorption to soil invertebrates—discussed in Section 9.1.5 on Page 220—are not represented on the figure. The figure must be revised to add this exposure pathway and these receptors.

3. **Section 9.1.5, Page 221, Paragraph 1**. "Texas Commission of Environmental Quality (TCEQ) 2006" is not included in the references. A reference appears to a Texas Natural Resource Conservation Commission document with the same date. The reference must be reviewed and the appropriate changes made in the report.

4. **Section 9.1.7.2, Page 224, Paragraph 1**. The EPA Region 4 soil screening benchmark documentation is listed in the text as "EPA 2001," while in the reference section it is listed as "EPA 2001a." The text must be revised to be consistent with the reference section.

5. **Section 9.2.1, Page 224, Paragraph 2**. The third sentence references Section 9.2.5, but this section does not exist. Revise the reference to specify Section 9.1.5.

6. **Section 9.2.2.1, Page 227, Paragraph 3**. The second sentence states 11 metals are carried forward as COPECs; however, 12 metals actually are carried forward. The text must be corrected accordingly.

7. **Section 9.2.2.1, Page 227, , Paragraph 5**. The paragraph states that calcium, magnesium, potassium, and sodium are not carried forward as COPECS, but Table J.5 contradicts this statement and identifies potassium as a COPEC. Table J.5 must be revised or a footnote added providing justification for not carrying forward the metals.

8. **Section 9.2.2.1, Page 228, , Paragraph 4**. The paragraph states 98 percent of the samples analyzed for n-nitrosodiphenylamine had a limit of detection (LOD) for that analyte below its Ecological Screening Value (ESV). However, this is in error—n-nitrosodi-n-propylamine should be specified instead of n-nitrosodiphenylamine. The text must be corrected accordingly.

9. **Section 9.2.2.1, Page 229, Paragraph 1**. The paragraph lists three VOCs not detected in surface soil and lacking ESVs. This list includes 1,2-dibromo-3-chloropropane, while Table J.7 lists 1,2-dibromoethane. The text or table must be revised to be consistent.

10. **Section 9.2.2.2, Page 232, , Paragraph 2**. The text identifies the constituent 2,4-dimethylphenol twice, and 2,4-dinitrophenol is not included—inconsistent with the information in Table J.9. Moreover, 2,4-dinitro-2-methylphenol is also included in the list, but 4,6-dinitro-2-methylphenol is listed in Table J.9. The text must be revised to be consistent with Table J.9.

11. **Section 9.2.2.2, Page 232, Paragraph 3**. Ninety-four percent of the samples analyzed for n-nitrosodi-n-propylamine had a LOD for that analyte below its ESV. This COPEC must be added to the paragraph.

12. **Section 9.2.2.2, Page 233, Paragraph 1**. The paragraph lists three VOCs not detected in surface soil and lacking ESVs. This list in the text includes 1,2-dibromo-3-chloropropane, while Table J.10 lists 1,2-dibromoethane and does not include 1,2-dibromo-3-chloropropane. The text or table must be revised to be consistent.

13. **Section 9.2.2.3, Page 233, Paragraph 3**. 1,1,2,2-tetrachloroethane is listed in the last sentence as not carried forward as a COPEC because it has an SQ of less than one. However, it is not included in Table J.11 as having been detected in surface soil within Area 3. The text or table must be revised to be consistent.

14. **Section 9.2.2.3, Page 235, Paragraph 1**. According to Table J.11, Aroclor 1260 (9 out of 54) was the most frequently detected Aroclor, not Aroclor 1254 (7 out of 54). The text must be revised to be consistent with the information in the table.

15. **Section 9.2.2.2 and Section 9.2.2.3**. Table J.5 identifies potassium as a COPEC; however, potassium is not discussed in either section, and is not included in any tables corresponding to Section 9.2.2.2. The text or table must be revised to be consistent.

16. **Section 9.2.3.1**. **Page 237, Paragraph 4** The introduction should identify to the reader the location of the table used to support the statements in the text. The text should refer the reader to the supporting table—Table J.14.

17. **Section 9.2.3.2, Page 239, Paragraph 1**. Aroclor 1016, Aroclor 1221, Aroclor 1232, and Aroclor 1242 are included in the text as carried forward in the risk assessment process to Step 3; however, these are not listed in Table J.14. The document must be revised to render the text and table consistent.

18. **Section 9.2.3.2, Page 239, Paragraph 2**. The SQ values listed in the text for lead and manganese (7.7 and 6.9, respectively) are not consistent with Table J.14 for the post-development dataset. The document must be revised to render the text and table consistent.

19. **Section 9.2.3.4, Page 239, Paragraph 4** . The introduction should identify to the reader the location of the table used to support the statements made in the text. The text should refer the reader to the supporting table—Table J.15.

20. **Section 9.2.3.4, Page 239,Paragraph 4**. The paragraph states that under current conditions, only three VOCs were carried forward as COPECs. According to Table J.11, nine VOCs were carried forward as COPECs. The text should discuss all COPECs and provide justification as to why they were not carried forward for the either the current conditions or post-development conditions.

21. **Section 9.2.3.4, Page 240, Paragraph 4**. The paragraph states that the SQ for high molecular weight (HMW) PAHs for the post-development is the same as the SQ for current Site conditions—both at 7.5. However, according to Table J.11, for current conditions, the SQ is 57; and according to Table J.15, for post-development conditions, the SQ is 54. The text must be revised to reflect the actual values.

22. **Section 9.2.3.4, Page 240, Paragraph 5**. According to Tables J.11 and Tables J.15, all three Aroclor species and total PCBs SQ values are the same for current conditions and post-development conditions. The text should be revised to be consistent with the table. Also, Aroclor 1016, Aroclor 1221, Aroclor 1232, and Aroclor 1242 are included in the text as carried forward to Step 3 in the risk assessment process; however, these are not included in Table J.15. The document must be revised to render the text and table consistent.

23. **Section 10.1.4, Page 253, Paragraph 2**. The paragraph refers to Table J.14, which is incorrect. The reference should be to Table J.16. The text must be revised to correct this error.

24. **Section 10.1.4, Page 253, Paragraph 4**. This paragraph refers to Figure 9.2; however, Figure 9.2 does not exist. The text must be revised to address this issue.

25. **Section 10.1.4, Page 254, Paragraph 0**. The first sentence states "Two SVOCs (cymene and isopropylbenzene)…", it should say "Two VOCs (cymene and isopropylbenzene)…" Also, Figure 9.2 is referred to in the paragraph; however, Figure 9.2 does not exist. The text must be revised to address this issue.

26. **Table J.4**. The ESV source for chromium is incorrectly listed as the Ecological Soil Screening Levels (ECO-SSL) Mammalian value. The ESV is actually the ECO-SSL Avian value for chromium III. The table must be revised to address this issue.

27. **Table J.4, Page 1**. The constituent 1,2-dibromo-3-chloropropane is listed twice in the table, and the second listing is accompanied by the incorrect ESV. The table must be revised to address this issue.

28. **Table J.4, Page 1**. The table does not provide an ESV for 1,2-dibromoethane, while it is listed in the EPA R5 Ecological Screening Level (ESL) source with an ESV as 1,230 micrograms per kilogram (µg/kg). The table must be revised to address this issue.

29. **Table J.4, Page 1**. The source Dutch Intervention is used as the source for the ESV for methyl tertiary butyl ether (MTBE), and this source is not listed in the tiered approach in Section 9.1.7.2. The text must be revised to add this source to the tiered approach or provide further justification as to why this source was used.

30. **Table J.4, Page 2**. An ESV is reported by the EPA R5 ESL source for 1,2,4,5- tetrachlorobenzene as 2,020 µg/kg. This ESV should be used, and the table and text should be revised to include it.

31. **Table J.4, Page 3**. The ESV for 4-methylphenol provided in the table is incorrect. The ESV for m-cresol was used, and the ESV for p-cresol (4-methylphenol)—163,000 µg/kg—should have been used. The table and all corresponding locations throughout the document should be revised to specify the correct ESV for 4-methylphenol.

32. **Table J.4, Page 3**. The constituent n-nitrosodi-n-propylamine is repeated in the table, but is specified incorrectly in the first instance as n-nitroso-di-n-propylamine. The table must be revised accordingly.

33. **Table J.4, Page 3**. The ESV for 3-methylphenol listed in the table is incorrect. The ESV for p-cresol was used, and the ESV for m-cresol (3-methylphenol)—3,490 µg/kg—should have been used. The table and all corresponding locations throughout the document should be revised to specify the correct ESV for 3-methylphenol.

34. **Table J.4**. According to Section 9.1.7.2, the ESVs were taken from sources in a tiered approach, with the Tier I source as EPA ECO-Soil Screening Levels (SSL), Tier II as EPA Region 5 ESLs, and Tier III as the lowest value among: Oak Ridge National Laboratory (ORNL) ecological screening benchmarks for soil and litter invertebrates, ORNL ecological screening benchmarks for terrestrial plants, or EPA Region 4 soil screening benchmarks. The following constituents' ESV values were reported from sources in Tier III, even though ESV values are available from the Tier II source:
    - Toluene
    - 2,4,5-Trichlorophenol
    - 2,4,6-Trichlorophenol
    - Diethylphthalate

- Di-n-butylphthalate
- Hexachlorocyclopentadiene
- Nitrobenzene
- N-Nitrosodiphenylamine.

Justification should be provided for this deviation from the protocol, or the table should be revised along with all corresponding locations throughout the document.

35. **Table J.4. Notes**. The references for ORNL Invertebrates, ORNL Microbes, and ORNL Plants need attached letters to distinguish between the two documents.

36. **Table J.4 Notes**. The references listed for EPA R4 and EPA R5 ESLs are not consistent with the citations provided in the references section, Section 11. The table must be revised to be consistent with the text.

37. **Table J.5**. The sum of LMW PAHs maximum concentrations does not equal 3611; it equals 3790. The table must be corrected.

38. **Table J.5**. The sum of HMW PAHs maximum concentrations does not equal 8250; it equals 8610. The table must be corrected.

39. **Table J.5**. The Total PCBs maximum concentration total does not equal 1190; it equals 1242. The table must be corrected.

40. **Table J.8**. The sum of LMW PAHs maximum concentrations does not equal 25560; it equals 32000. The table must be corrected.

41. **Table J.8**. The sum of HMW PAHs maximum concentrations does not equal 55800; it equals 57300. The table must be corrected.

42. **Table J.8**. The Total PCBs maximum concentration total does not equal 11000; it equals 11460. The table must be corrected.

43. **Table J.11**. The sum of LMW PAHs maximum concentrations does not equal 86650; it equals 98150. The table must be corrected.

44. **Table J.11**. The sum of HMW PAHs maximum concentrations does not equal 63000; it equals 90300. The table must be corrected.

45. **Table J.11**. The Total PCBs maximum concentration total does not equal 400; it equals 510. The table must be corrected.

46. **Table J.14**. The SQ value for vanadium is missing from the table. The table must be corrected.